CLAIMS:

1. A sound transducer comprising at least one sound unit based on at least one radially sound emitting diaphragm arranged in a substantially cylindrical or tubular form, said diaphragm consisting at least partly of electromechanically converting material capable of creating sound by changing its physical state upon electrical excitation, **wherein** within a single sound unit said diaphragm is arranged to be supported between an inner sound guiding sleeve and an outer sound guiding sleeve, said sleeves having substantially similar radial cross-sectional shape than said diaphragm, in order to form at least one axial acoustic channel between the diaphragm and at least one of said sleeves, so that the sound waves generated by the diaphragm are arranged to be guided along said acoustic channel out from the sound unit, and that at least at the exit side of said acoustic channel the axial ends of the diaphragm and the corresponding sound guiding sleeve are arranged to have mutual non-alignment in the plane perpendicular to the axis of the sound unit in order to reduce the acoustic mass that said acoustic channel represents.

2. A sound transducer of claim 1, **wherein** within a sound unit the inner sound guiding sleeve is arranged with at least one front retainer located at the front end side of said sleeve for supporting the diaphragm and said sleeve in a specified mutual radial and axial position, and at least one rear retainer is located at the other end of the diaphragm between the diaphragm and the outer sound guiding sleeve for supporting the diaphragm and said sleeve in a specified mutual radial and axial position, and that the axial widths of said front or rear retainers are arranged to be taken into account in the formation of said mutual non-alignment for the reduction of acoustic mass.

3. A sound transducer of claim 1, **wherein** several sound units are arranged in a radially successive manner within each other in order to form a multi-diaphragm radially arranged transducer with several sound units coupled acoustically substantially in parallel.

4. A sound transducer of claim 3, **wherein** in a radially arranged transducer the inner sound guiding sleeve of an outer sound unit is arranged to function

as the outer sound guiding sleeve of the radially successive inner sound unit, and vice versa.

5. A sound transducer of claim 3, **wherein** in a radially arranged transducer the radially successive sound units have circular radial cross-sectional shapes and are arranged within each other concentrically having a common longitudinal axis of symmetry.

6. A sound transducer of claim 3, **wherein** in a radially arranged transducer the amount of axial non-alignment between the radially successive sound units is selected to be different at least between two sound units.

7. A sound transducer of claim 3, **wherein** in a radially arranged transducer the direction of axial non-alignment between the radially successive sound units is selected to be different at least between two sound units.

8. A sound transducer of claim 3, **wherein** in a radially arranged transducer at least the diaphragms of two different sound units are arranged to be driven with different electrical drive signals.

9. A sound transducer of claim 8, **wherein** said electrical drive signals differ in their frequency bandwidth.

10. A sound transducer of claim 8, **wherein** said electrical drive signals differ in their relative signal amplitude.

11. A sound transducer of claim 1, **wherein** said at least one diaphragm is partly or completely made out of one or more of the following materials: piezoelectric material, electrostrictive material, pyroelectric material or electrostatic material.

12. A sound transducer of claim 11, **wherein** said at least one diaphragm is partly or completely made out of polyvinylidene fluoride.

13 A sound transducer of claim 2, **wh rein** in a single sound unit said front and/or said rear retainer together with said inner sound guiding sleeve form a single integrated part.

14. A sound transducer of claim 1, **wherein** the inner and outer sound guiding sleeves in a sound unit are partly or completely made out of one or more of the following rigid materials: plastic material or metal material.

15. A device with acoustic capabilities comprising at least one sound transducer with at least one sound unit based on at least one radially sound emitting diaphragm arranged in a substantially cylindrical or tubular form, said diaphragm consisting at least partly of electromechanically converting material capable of creating sound by changing its physical state upon electrical excitation, **wherein** within a single sound unit said diaphragm is arranged to be supported between an inner sound guiding sleeve and an outer sound guiding sleeve, said sleeves having substantially similar radial cross-sectional shape than said diaphragm, in order to form at least one axial acoustic channel between the diaphragm and at least one of said sleeves, so that the sound waves generated by the diaphragm are arranged to be guided along said acoustic channel out from the sound unit, and that at least at the exit side of said acoustic channel the axial ends of the diaphragm and the corresponding sound guiding sleeve are arranged to have mutual non-alignment in the plane perpendicular to the axis of the sound unit in order to reduce the acoustic mass that said acoustic channel represents.

16. A device of claim 15, **wherein** in a sound transducer several sound units are arranged in radially successive manner within each other in order to form a multi-diaphragm radially arranged transducer with several sound units coupled acoustically substantially in parallel.

17. A device of claim 16, **wherein** in a radially arranged transducer said sound units have circular radial cross-sectional shape and are arranged within each other concentrically having common longitudinal axis of symmetry.

18. A device of claim 16, **wherein** in a radially arranged transducer the amount of axial non-alignment between the radially successive sound units is selected to be different at least between two sound units.

18. A device of claim 16, **wherein** in a radially arranged transducer the direction of axial non-alignment between the radially successive sound units is selected to be different at least between two sound units.

19. A device of claim 15 **wherein** said at least one diaphragm of at least one sound unit in a sound transducer is partly or completely made out of one or more of the following materials: piezoelectric material, electrostrictive material, pyroelectric material or electrostatic material.

20. A device of claim 19, **wherein** said at least one diaphragm is partly or completely made out of polyvinylidene fluoride.

21. A device of claim 15, **wherein** said device is a device comprising one or more loudspeakers.

22. A device of claim 15, **wherein** said device is a portable audio device.

23. A device of claim 22, **wherein** said device is a portable player or receiver.

24. A device of claim 15, **wherein** said device is a headphone or headset comprising sound transducers separately for both ears of a listener.

25. A device of claim 15, **wherein** said device is an earpiece for a single ear of a listener.

26. A device of claim 15, **wherein** said device is a handsfree set.

27. A device of claim 15, **wherein** said device is a telecommunication device.

28. A device of claim 27, **wh rein** said device is a mobile telecommunication device.